Chapter 4
Challenges in Business Intelligence

Even though BI solutions are critical for almost every business, and businesses should be in possession of it from the very beginning, not every business have it. Some organizations have deployed BI solutions successfully and use it effectively whereas some have deployed but haven't been able to use it effectively. There are also organizations that are still struggling to implement BI solutions after approval while some are just waiting for an approval to start. According to a 2017-2018 survey by Gartner,[27] more than 87 percent of the organizations were classified as having low BI maturity. Every business, even those that use BI effectively, have faced and continue to face some BI specific challenges at every phase.

This chapter attempts to introduce to the learner various challenges faced by organizations in every phase of a BI journey. After going through this chapter, you should be equipped with a good understanding of challenges that organizations may face in every phase of their BI journey. What you can do by knowing these challenges depends on your role to a large extent. For example, if you are a CXO, VP, a newly appointed head of BI, or someone who is about to start a BI initiative, it will help you to account some of these challenges in your plans and estimations. On the other hand, if you are a student or a BI job aspirant it will help you in your future job to be aware of these challenges. First, we'll introduce the main phases of a BI journey and then discuss the challenges faced in each of these phases. We continue to use

Walget (introduced in *Chapter 2: Why do Business need BI*) as an example. It will be easier to understand this chapter if you already understand software development processes and project management.

Structure

This chapter is structured as follows:

- Main phases in a BI journey
  - Initiation phase
    - ❖ Trigger for BI initiatives
  - Implementation phase
  - Live phase
    - ❖ Further development
    - ❖ Enhancements
    - ❖ Maintenance and Support
    - ❖ Migration
- Trigger for BI initiatives
- Challenges in the initiation phase
  - Resistance to the BI initiative
  - Building a good business case for BI
  - Acquiring sponsors and promoters
  - Getting it prioritized
- Challenges in the implementation phase
  - Data and information challenges
  - People challenges
  - Process challenges
  - Technology challenges
- Challenges in the live phase
  - Challenges faced by BI users
  - Challenges faced by BI technical team

Objectives

Understanding the BI capabilities ladder and getting an overview of the three main phases in a BI journey, activities involved in those phases and the challenges faced during each of those phases.

Main phases in a BI journey

By BI journey, it means the journey from the very start of building BI capabilities in an organization which then continues for as long as the organization exists. BI journey takes an organization from the bottom-most stair to the topmost stair of the BI capabilities ladder as depicted in *Figure 4.1*:

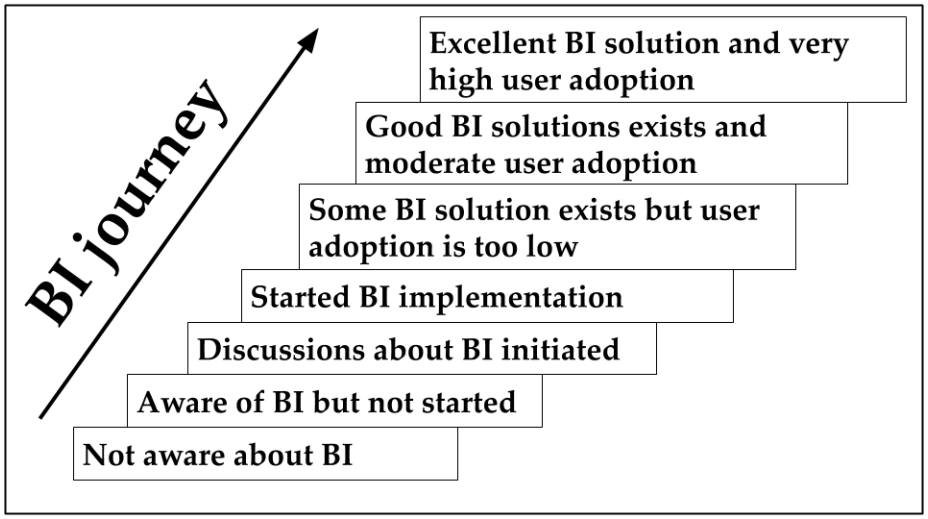

***Figure 4.1**: BI capabilities ladder*

Even at the time of writing (June 2020) there are many organizations that are still at the bottom-most stair of the BI capabilities ladder. One of the aims of this book is to increase awareness about BI among such organizations and help them climb the ladder and enable them to compete with bigger players. Strictly speaking there are no hard cut-offs as to what would be termed as low, moderate, and high user adoption. However, to provide some guidance, anything below 30% user adoption rate is low, 30 to 60% is moderate, and anything from 60% and above can be considered high. This can be calculated as:

$$User\ adoption\ rate\ = \frac{number\ of\ actual\ BI\ users}{number\ of\ potential\ BI\ users} \times 100$$

Apart from one of the organizations, all other organizations that I have worked at were at or above the 5th stair in the BI capabilities ladder. The only difference

between them and the one that was below 5th stair was that all others were large companies with over a few billion dollars in revenue per year while the one at the lower stair reported less than half a billion in yearly revenue. I should emphasize that it is not a straight-forward correlation that all billion dollars plus companies have excellent BI capabilities and all smaller companies in terms of revenue do not. For example, a US-headquartered background screening solution provider, First Advantage,[28] with revenue less than 1 billion USD has built state-of-the-art reporting and analytics solution not just for internal use of the company but also provides parts of this solution to its customers. So having a good BI solution or not is not to do with the revenue size, but with the vision. Now let's look at the different phases of BI journey.

In BI journey there are broadly three phases, and the order is as depicted in *Figure 4.2*:

1. Initiation phase
2. Implementation phase
3. Live phase

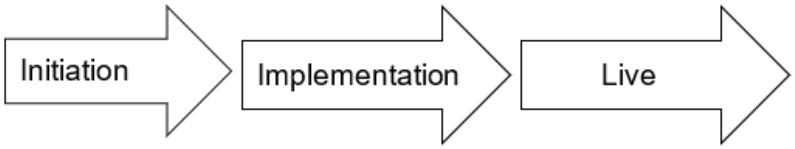

***Figure 4.2**: The 3 main phases in a BI journey*

In practice, there are several phases, however, our intention is not to detail the different phases of a software development life cycle or all the phases of project management. Here, the intention is to provide a broad view of the BI journey that an organization follows so that we are able to map the challenges per phase accordingly. We could of course directly list all of the challenges without discussing these phases, however, that would make it quite difficult to understand for people who are not aware of BI or IT solution implementations. Knowing these phases helps set the context, allowing readers to understand the challenges better. Let's take a look at each of the three main phases of the BI journey.

Initiation phase

Initiation phase is not a fixed duration. Duration of initiation phase can last from weeks to years, it totally depends on the organization, its needs and priorities. If there is an urgent need for BI and the resources are available, the organization could start immediately, however, in most cases there isn't enough resources for BI initiatives to start immediately.

As the name suggests, the initiation phase starts when the idea or vision to build a BI solution or add BI capabilities is initiated within the organization. This phase ends when a BI initiative has been approved by the management as depicted in *Figure 4.3*:

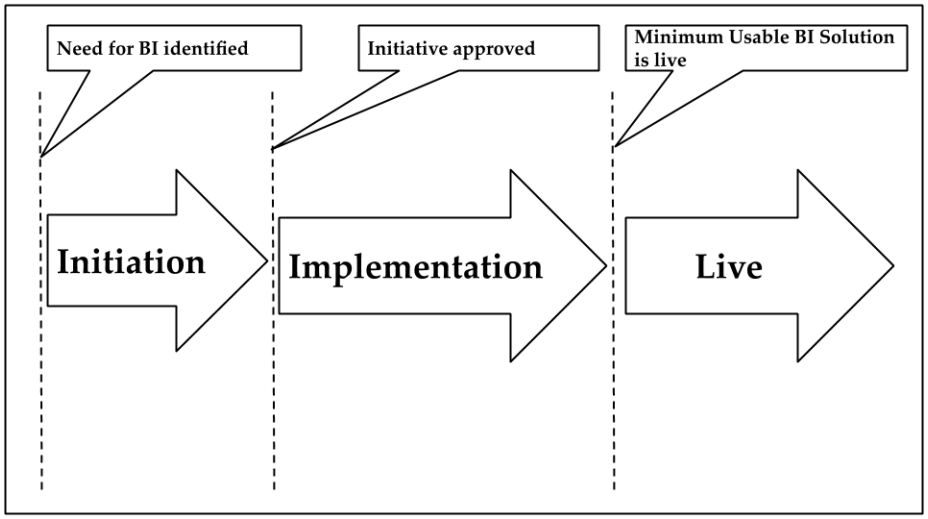

***Figure 4.3**: The 3 main phases in a BI journey with start and end points*

Approval for a BI initiative could mean different things for different organizations such as those listed below.

- Budget allocation for building BI capabilities
- Initiation of a BI program or a project
- Approval to create a BI team
- Approval to start a **request for proposal** (**RFP**)/**request for information** (**RFI**)/**request for quote** (**RFQ**) process to procure products or services to build BI capabilities
- Resources are identified and reserved or earmarked for BI
- A simple "*go-ahead*" or an in-principle agreement from management for BI
- Hiring of the first BI team member, raising a purchase order raised.

Now, you may be asking yourself, who actually initiates a BI journey and when? Or what is the trigger that leads someone to initiate a BI journey? How does it all start in an organization? The next section answers these questions.

Trigger for BI initiatives

In *Chapter 2: Why do businesses need BI*, we dealt extensively with the need for BI, that is, we have covered the "*why*" part of it. So, we will not be covering the reasons

why a business needs BI again. We will only go through those specific trigger points which leads to the initiation phase. The triggers that leads to BI initiatives could be one or more of the following reasons:

- Management triggers it as advised by one or more parties such as the advisory board, external consultants, market research firms, auditors, etc.
- Management triggers it after being convinced by BI vendor(s).
- Management triggers it based on a change in management where the new management has experience in using BI and know the importance of BI in organization.
- Implementation of a core business application or software solution which includes embedded BI or OOTB BI.
- Requested or demanded by customers (B2B or B2B2C business).
- Requested by internal departments.
- Management triggers it based on knowledge of competitors' or other businesses' BI endeavors.
- Requested by suppliers as other clients are providing it.
- Initiatives by employees based on their experience at other organizations.

There are could other trigger points too which are not captured in the above list, the main point is to get a rough idea about how BI initiatives are triggered.

Implementation phase

The term implementation here has been used to mean the whole end-to-end process of building a BI solution starting from the planning stage until the solution goes live. As we saw in *Figure 4.3*, the implementation phase starts when the management has approved to kick-off a BI initiative and it ends when a minimum usable solution has been deployed on production/live environment and the solution is made available for BI users. This phase includes activities such as planning, hiring BI team members, business analysis/requirements engineering, designing, procuring hardware and software, installation, establishing connectivity, data modelling, development/coding/programming, various types of development/IT team testing activities, BI user testing activities, release planning and deployments. The aforementioned activities are valid for building BI capabilities entirely in-house. In case of outsourcing, most of these processes are outsourced except for managerial activities. In case of mixed models, where both in-house BI team members and outsourcing partner team members collaborate and work together, the activities are shared between both in-house team members and outsourcing partner team

members. The extent to which the activities are shared depend on the specifics of the contracts between the organizations.

Live phase

The live phase begins when the **minimum usable solution** (**MUS**) is live. That is the BI solution is deployed in the production environment and is available for BI users. This phase of the BI journey continues as long as the organization exists. I haven't heard or seen a case where a company has got rid of BI after using it. As explained in Chapter *1: What is Business Intelligence*, BI is not a one-off activity, it is a continuous process. So, once MUS is live, it goes through further development, enhancements, maintenance (fixes and upgrades), and possibly migrations and replacements. Let's briefly look at the activities within these categories. It must be noted that, in practice, there are different interpretations of these categories in different organizations and therefore following explanation for these categories is one of the most common interpretation based on experience.

Further development

All of the development activities that were mentioned in the implementation phase are repeated here. It could be to add new sets of data from existing data sources, integrating new data sources, developing new dashboards, reports, new capabilities, and more. For example, let's say Walget has four data sources such as **point of sale** (**POS**), **customer relationship management** (**CRM**), inventory management, and **job application system** (**JAS**). Out of these four data sources, the first three were considered as mandatory data sources for MUS and the solution went live with only those three as the data sources. In further development, the data source JAS was integrated into the solution.

Enhancements

Enhancements are the improvements or addition of features to the existing solutions. Using previous example of Walget, enhancements include data quality improvements for existing data sources (POS, CRM, and inventory management), changes to dashboards and reports, creation of reports, metrics/measures, dimensions/attributes, performance improvements, etc.

Maintenance and support

The activities in this category include bug fixes, applying patches, and upgrading of hardware and software. In many organizations, support and maintenance activities are carried out by the same team. As part of support activities, the team ensures that the applications are available, incidents and problems are resolved, and new versions are deployed. For those who don't understand what bug fixes, patches, and

incidents mean in the context of BI, let's look at few short examples to give you an idea.

- **Bug fixes**: Essentially it means fixing a bug, that is, making necessary changes to the system to ensure it fixes an issue detected in the system. Example: A report crashes when data is in a different language other than English. If there was a requirement to ensure that reports should be able to handle other languages as well then, this issue would be considered as a bug as it doesn't meet the requirement. And the bug fix would be to make changes to the report or underlying database to ensure that the report doesn't crash when data is in other languages.
- **Patches**: When there is an issue or possibility of an incident occurring in the production environment, a patch (temporary fix) may need to be applied to ensure that the system continues to work. For example, let's assume that a database is almost full (reaching its max capacity), due to which daily batch jobs running in the production environment may fail because no more data can be loaded once database is full. A patch here would be to run a script that would delete data from copies of old backup tables that are no longer required. A proper fix such as developing a batch job that auto purges older irrelevant data periodically might take longer time. So, a patch is a temporary fix.
- **Incident**: Incident is an unplanned interruption. Let's assume that the daily batch load failed and therefore data of the previous day is missing in the data warehouse. BI users are unable to use the dashboards without previous day's data and therefore they raise an incident stating that data of previous day is missing in the dashboards.

Migration

Usually, people forget to include this category. In a BI solution, because it has so many components that make up the BI architecture as we have seen in *Chapter 1: What is Business Intelligence*, we regularly face situations where BI migration activities are carried out. It could be a full stack migration from one set of tools to another set of tools, or migration of only one or more tools used in the BI solution. For example, let's assume that Walget uses IBM DataStage as their ETL (data integration) tool, and now for internal reasons it was decided that Walget should migrate to an open-source ETL tool such as Pentaho or Talend. This will lead to a migration activity from DataStage to Pentaho or Talend. Note that the migration activity might itself be a separate project, however, it is still part of the live phase of a BI journey.

We haven't gone into too much detail about the different phases intentionally and have limited content to just the right level of details to ensure sufficient understanding and to be able to understand the challenges in BI corresponding to those phases.

Let's now get to the challenges.

Challenges faced in the initiation phase

These are some of the challenges faced by any of the BI journey initiators such as head of a business unit, consultant, etc. It includes the following:

- Dealing with internal resistance to the BI initiative
- Building a good business case for BI
- Acquiring sponsors and promoters for BI initiative
- Getting BI initiative prioritized

While the last 3 challenges in the above list are quite self-explanatory, the 1st one needs more detailed explanation. So, in the following pages we will look at the 1st challenge in detail and the last 3 will only be discussed briefly.

Resistance to the BI initiative

In my experience, I haven't seen any employee openly opposing a BI initiative in any of the organizations. However, in some companies, I have noticed that there is some resistance, and some employees are deliberately trying to delay BI initiatives as much as possible. Why would there be any resistance from employees when BI is supposed to help and support them in their work? Some of the reasons for resistance are actually genuine concerns while some are not. To some of you, yet to enter into the corporate life, these reasons may look fictious but let me assure you that each of the reasons discussed here, unless marked otherwise, are real. As mentioned in the beginning of this chapter, it is important to be aware of these challenges so that you can navigate them better. Let's go through some of the reasons provided in the *Table 4.1* due to which employees may resist BI initiatives.

Reasons	Description
Concerns over high costs	As with any other initiative, there is a cost involved and BI was always associated with high cost. Therefore, some employees resist BI initiatives because of their past knowledge about its high cost. In the past, companies in fact did have to spend millions of dollars to implement BI solutions. However, as clarified in *Chapter 1: What is Business Intelligence*, this is no longer the case. But not everyone is aware about this change, so they continue to resist BI initiatives.

Concerns over long duration	BI solutions implemented in the past are known for implementation durations extending over multiple years or never ending at all. Again, as mentioned in *Chapter 1: What is Business Intelligence*, this is no longer the case.
Organization culture / Change aversion	An organization may have largely got used to working the way it has been working for a long time and doesn't want to change or adapt. They don't realize that there is a need for change in the way of working to improve efficiency.
Job insecurity	This is one of the major reasons. Some employees resist due to a fear of losing their jobs, especially due to automation. As discussed in *Chapter 1: What is Business Intelligence*, the BI process is largely about automation or semi-automation of the information and insights generation process to support decision makers.
Fear of gaps and inefficiencies being exposed	Some employees or departments fear that the gaps and inefficiencies in the current systems, processes, finances, way of working, etc., could be exposed as part of the BI initiative.
Fear of not being able to continue with fraudulent activities	When organizations have BI capabilities, chances of fraud reduce as transparency increases. Employees, including management, who indulge in fraudulent activities try to delay any such initiatives so that they can carry on with their fraudulent activities. When quarterly or annual reports are based on data from a well-built BI solution, it can help prevent fraud.
Fear of losing importance	When BI is implemented with proper data governance, everyone who is supposed to get access to information, gets access, there is no need for BI users to request favours from someone to get the information. Those employees who were in such positions, whom rest of the employees had to depend on for information and insights, fear losing their importance in the organization.
Concerns about high failure rates	According to some articles across several websites, up to 60 to 70% of BI projects have failed. So, this argument could be used to block a BI initiative in an organization. Note: None of these articles have provided what exactly they mean by failed and how they have actually calculated it.

Excel is enough	Some employees resist BI initiatives stating that they already use MS Excel, they are familiar with it, it works for them and there is no need for anything more.

***Table 4.1**: Reasons for resistance to BI initiatives*

We can understand from the reasons for resistance to BI initiatives provided in the *Table 4.1* that most of these are not in the interest of the organization but personal agenda.

Building a good business case for BI

It's not easy to build a compelling business case for BI. As we have learnt in previous chapters, BI is meant for improving the business and to manage business better. However, to improve something, it should be clearly known what the current situation is and where does the company see itself in the short, medium, and long term. What are the company's or the business unit's vision, mission, goals, objectives, and strategy? For example, if the goal of Walget is to become the number one retailer in country X, and the objectives are set as

1. Year-on-Year increase in revenue by 20%
2. Obtaining 4.5 or higher out of 5 in customer satisfaction

Then a compelling business case can be built for BI solution by articulating how it is a necessity to effectively manage Walget and not only achieve the objectives but also outperform. To do this, the initiator should have sufficient business knowledge or should have support and cooperation from management. As we saw in *Chapter 2: Why do businesses need BI*, there are quite a lot of tangible and non-tangible long-term benefits of BI, but a lot of these benefits can only be derived based on the goals and objectives of the department or the enterprise. In the *Chapter 6: Financials of Business Intelligence*, we will cover the details of calculating the cost and return on investment on BI projects.

Acquiring sponsors and promoters

One of the challenges during initiation phase is to get the top management's support and backing to pursue the initiation phase. Support of management not to be confused with the approval for project, but just the approval to do the groundwork of coming up with a business case, understanding company goals, objectives, etc. The other related challenge is to get the time of the top management, usually it's tough to get their time, and then to convince them in a very short time. Without top management support and backing, middle management and others may not be willing to cooperate and support in the initiation phase.

Getting it prioritized

A business in the short run can continue to run its business without BI. BI projects are internal projects. It so may happen that the management focuses on urgent operational topics and ends up deprioritizing BI initiatives. For example, they may prioritize custom development of an application requested by a customer over internal BI initiative. The problem is, the custom development never ends, by the time a customer's request is met, new ones come up and hinder BI initiatives.

Challenges in the implementation phase

Challenges in the implementation phase refer to those challenges that are faced by the BI team(s) once they have started the implementation phase. To understand these challenges better, we need to think from a perspective of a Head of BI or similar positions, that is, someone at management level who is responsible for the BI solutions. The level or complexity of the challenge depend on whether the BI initiative is a department-level initiative or an enterprise-level initiative. If the BI solution's scope is limited to a single department, the challenges are obviously relatively smaller.

BI solutions which have their scope limited to a specific software product (for example, Jira), a specific dataset (for example, web stats), or to a specific customer, etc., could face lesser number of challenges than those that are generic BI solutions (Enterprise BI) involving multiple source applications, multiple data sources, multiple customers (B2B), etc. While we go through this list of challenges, in the backdrop, let's assume that Walget in the past didn't have a BI solution and at some point decided to build a BI solution. As part of its first project, Walget decided to derive information and insights from sales, employees, and suppliers' data as shown in *Figure 4.4* to enable managers across all levels to make data-based decisions:

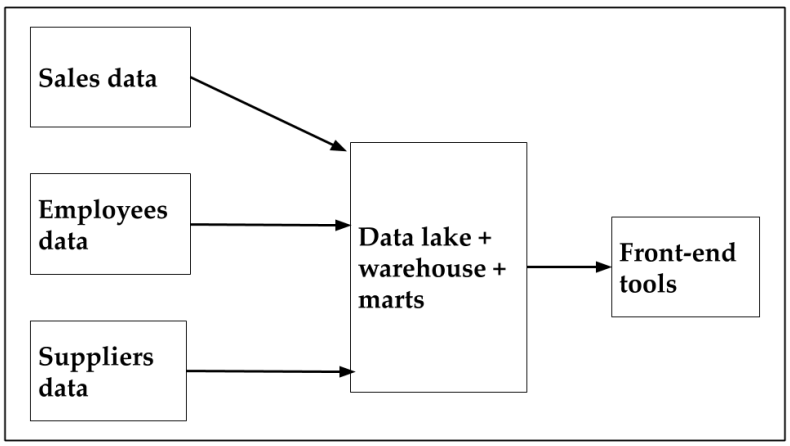

***Figure 4.4**: Walget example of first BI implementation*

The challenges faced in the BI implementation phase can be grouped under 4 main categories as listed below:

- Data and information challenges
- People challenges
- Process challenges
- Technology challenges

Some of the challenges actually belong to more than one of the four categories, there is a strong association to one category and weak association to other categories. Challenges are explained under the category in which it strongly belongs. Additionally, to highlight that a challenge also belongs to another category it is marked as (**DI**) **Data and information**, (**PE**) **People**, (**PR**) **Processes** and (**TE**) **Technology** accordingly.

Data and information challenges

Challenges that are mostly related to data and those that are related to lack of information about data (metadata) are grouped under this header. The list of challenges in this category are as follows:

- Data quality issues (DI, PE, PR)
- Data governance challenges (DI, PE, PR)
- Data privacy and security (DI, PE, PR, TE)
- Data acquisition challenges (DI, TE)
- Lack of information (DI, PE, PR)
- Lack of business knowledge (DI, PE, PR)

Each of the challenges in this category are explained as follows:

- **Data quality issues (DI, PE, PR)**: Data quality issues are one of the biggest and hidden challenges as depth of the challenge is known only later. BI team usually becomes reluctant owner of this topic. It is noticed that until a BI or some other data initiative starts, data quality doesn't get checked or assessed, its only after BI implementation starts that the poor quality of data is exposed. It is also important to be aware that when the data quality issues are actually mitigated by a BI team, the effort doesn't get noticed by management and others but when the reports and dashboards have bad data quality, BI team gets the blame. It's a thankless job to clean data. A couple of examples of data quality issues are as follows:

Situation: An employee at Walget changes his name, because of a process issue the name is updated only in 1 of the 5 systems.

Data quality issue 1: Now in one system he is considered as one person whereas in all the other 4 systems he is considered as 2 different persons as both his names are available.

Data quality issue 2: As his old records are not updated with the new name, his historic records and current records appear as if they are about two different people.

- **Data governance challenges (DI, PE, PR)**: Data governance challenges, especially those related to data ownership and master data management. Which set of data should be considered as master data? Who is the data owner? Dealing with the situation where employees are unwilling to take up responsibilities of a data owner. For example, which of the 5 HR systems' data should be considered as master data of employees? Who should be the data owner of the HR systems?

- **Data privacy and security (DI, PE, PR, TE)**: This challenge can also be placed under data governance. But the importance it deserves, especially now, with regulations on data privacy such as GDPR makes it a very important topic that it deserves a separate mention. The challenge in implementing a BI solution with respect to this challenge lies in ensuring that maximum information and insights are gained from data without violating any of the regulations and directives on data privacy and any of the data security mandates. On one hand, if companies focus only on getting maximum insights from data and violate data privacy regulations or data security mandates, they may have short-term benefits but can end up getting fined huge amounts. On the other hand, if companies don't derive insights from data, they will lose out to competition by not having a competitive edge. For example, to understand what is the maximum spend or total spend by a distinct customer at Walget, Walget has to ensure that all the transactions of each of the customers' is combined based on a unique identifier of a person and combine the transactions irrespective of whether the customer has carried out purchase at store, through the website, or through the mobile app using different payment options in each case. To be able to do this, the customer identity (distinctness) needs to be maintained and at the same time data privacy should also be ensured.

- **Data acquisition challenges (DI, TE)**: Data for the same topic could be spread across multiple applications. For example, there could be multiple employee management (HR) systems depending on regional or country specific needs and one system could have some more or some less data than the other. Some applications could be on-premises whereas some on

the cloud in different cloud models. BI teams will have to explore options, contact suppliers, vendors, and partners to understand the details about data.

- **Lack of information (DI, PE, PR)**: Issues such as lack of transparency about the business processes. Lack of documentation on source applications and systems. Some of the applications could be legacy without any documentation and people who built it could have already quit the organization. There is data but no information or not enough metadata (business metadata and technical metadata).
- **Lack of business knowledge (DI, PE, PR)**: Lack of domain or sector and business specific knowledge such as business model, operations, key data assets, etc. Again, lack of business metadata.

People challenges

All of the challenges related to people such as leadership issues, and team challenges are grouped under this heading. The list of challenges in this category are as follows:

- Inexperienced leadership (PE)
- Executive sponsor continuity (PE)
- Petty politics (PE, PR)
- Team challenges (PE)

Each of challenges in this category are explained below.

- **Inexperienced leadership (PE)**: Lacking vision or long-term goals, that is, lack of visionary leadership. People at the top pushing for quick-and-dirty solutions instead of building scalable robust solutions in agile methodology. Dealing with inexperienced leadership, especially with those who don't have much idea about the potential of data is quite a challenge.
- **Executive sponsor continuity (PE)**: Ensuring that there is continuity in executive sponsorship and support. The support with which the project kicks-off can die out over a period of time. Dealing with top management to continue the support is a challenge. As reorganization is quite common, the sponsor may move out to another department or location and the replacement may not be in favor of the BI initiative.
- **Petty politics (PE, PR)**: Interdepartmental petty politics, data hoarding, lack of cooperation from other departments, business units, or sister companies. In one of the organizations that I worked, the central or enterprise BI team was in the same business unit as a business product unit (A). The VP of business unit A was also the VP of enterprise BI team. Business unit B, which

had a different VP, did not get any support from enterprise BI team and none of the requirements from business unit B were taken up by the enterprise BI team.

- **Team challenges (PE)**: Lack of skilled BI team members. There is a huge demand for BI talent. Keeping the BI team motivated and retaining the existing team. An ideal candidate in general is one who meets the requirements as listed:
  - Domain or sector knowledge
  - Business specific knowledge
  - The exact tools (for example, MicroStrategy, DataStage, Tableau) and technology (data integration, columnar databases) expertise
  - Team player
  - Soft skills

Usually, we find it hard to get candidates with all of these requirements fulfilled, so we select the one who can fulfil most of it if not all of it.

Process challenges

All of the challenges that are mostly related to processes in an organization are grouped under this header. The list of challenges in this category is as follows:

- Wrong processes applied (PE, PR)
- Lack of funding (PR)
- Prioritization challenges (PR)
- Coordinated delivery (PR)
- Project over product approach (PE, PR)
- Project complexity (PE, PR)

Each of challenges in this category are explained as follows:

- **Wrong processes applied (PE, PR)**: Dealing with over complicated development standards set across organization which may not be useful and applicable for BI projects. For example, carrying out a full blown and heavy release process for reports or dashboards or convincing non-BI architects not to apply the same principles of software development to BI solution development.
- **Lack of funding (PR)**: Managing to deliver equal or better-quality solutions with a lower budget compared to other application development teams. Often, BI is an after-thought, the core applications' development teams get

most of the budget understandably because that is what runs the business and relatively lower budgets are marked for BI team, but when it comes to expectations, same or better quality is expected.

- **Prioritization challenges (PR)**: Prioritizing BI initiatives appropriately. BI team members and teams allocated to non-BI tasks, for example, data migration for an application upgrade, or permanent or temporary de-prioritization of the BI program/initiative.
- **Coordinated delivery (PR)**: Coordinated delivery, that is across BI teams and together with source application teams. For example, let's assume that the sales software application in Walget is maintained and enhanced by team A, HR software application is maintained and enhanced by team B, and the supplier management software application is maintained and enhanced by team C. Whenever any of the teams A, B or C make changes to the corresponding applications and there is an impact on BI solution, the BI team(s) has/ have to ensure that it incorporates the data changes and delivers the changes together with the source teams. The priorities for core application development teams could be different from priorities for BI team.
- **Project over product approach (PE, PR)**: Focusing more on project closure over product/solution development approach and thereby descoping some of the essential requirements or delivering ineffective, non-working, or unusable solutions.
- **Project complexity (PE, PR)**: Management of the complexity and size of the project, program, or initiative. It is a challenge to keep the scope fixed, unlike other projects, in BI, usually the future users of a BI solution usually don't know what exactly is required till they have seen the 1st version of what they asked for and therefore changes in requirements are inevitable.

Technology challenges

The number of technology challenges can become a big list. Here, content is limited to the most common technology challenges with respect to BI. The list of challenges in this category is as follows:

- Variety of requirements (TE)
- Dependencies (PR, TE)
- Timelines for 1st deliverable (TE, PE)
- Too many technologies and tools distractions (PE, PR, TE)
- Performance challenges (TE)

Each of challenges in this category are explained as follows:

- **Variety of requirements (TE)**: Fulfilling wide variety of requirements for stakeholders at different levels of hierarchy, from first-line managers to top-level management. For example, some of the BI users expect that information should be fed to them and others prefer to access BI portal themselves. So, the solution has to be built considering a variety of users and their requirements.
- **Dependencies (PR, TE)**: Dependencies on central IT team for provisioning of infrastructure such as hardware, software, platforms, network, etc. Usually, BI teams are not at the top of the priority list for central IT teams. Selection of tools and technologies usually has to be in accordance with enterprise IT recommendations, but enterprise IT may not be familiar or may not be ready to support BI technical requirements.
- **Timelines for 1st deliverable (TE, PE)**: Managing stakeholder expectations with respect to the first deliverable timeline is quite a challenge as the first deliverable **minimum usable solution** (**MUS**) is only possible after a minimum foundation (for example, a data warehouse) has been built.
- **Too many technologies and tools distractions (PE, PR, TE)**: Dealing with team members or management getting carried away by buzzwords, hype, and vendor marketing, and investing in wrong tools and technologies.
- **Performance challenges (TE)**: Building systems that can deal with vast amounts of data and at the same time handle high expectations of data freshness. Building systems that can handle not only current size of data but also that which considers future growth. Ensuring that the solution works for global users in different time zones.

Challenges in the live phase

The challenges faced in the live phase of a BI journey are grouped into two categories; challenges faced by BI users and the challenges faced by the BI technical team.

Challenges faced by BI users

To understand these challenges, we need to think from a perspective of a BI user, for example, as a sales manager HR manager or a marketing manager. *Table 4.2* captures most of these challenges faced during the BI live phase in no particular order:

Challenges	People	Process	Technology
Limited access to the BI solution. Too many restrictions. Too much control by the BI or IT team. Delay in getting access to BI solutions. Some of the features and capabilities are disabled.		X	
Lack of proper self-service BI solutions, therefore for any ad hoc analysis users have to again depend on BI technical teams or data analysts.			X
Not all data that is required for analysis is available. For example, a new system went live, it may take a few weeks/months before this system's data is integrated in the data warehouse.		X	
Delay in processing data (in case of batch processing) and therefore data is available a day or more later.			X
While the solutions advertised or marketed works well with thousands of records, when the number of records is in millions and billions, the solution hangs or takes more time than users can wait.			X
Status of the BI solution, status of the daily data load, information about data quality is not available.		X	
Collaboration with other BI users through the BI portal is not possible or options are limited.			X

***Table 4.2**: Challenges faced by BI users in the live phase*

Challenges faced by BI technical team

To understand these challenges, we need to think from a perspective of a BI team, team lead of BI, head of BI, etc. Note that within a BI team or department there could be different sub teams for development, enhancements, maintenance and support,

and migration. *Table 4.3* captures most of these challenges faced by BI team during the BI live phase in no particular order:

Challenges	People	Process	Technology
Low user adoption rate - To get potential users to use the BI solution is one of biggest challenges. They are used to working with spreadsheets and are reluctant to switch to a different solution. Users prefer to get data extracts so that they can work in Excel, or download data from BI portals and work in Excel sheets. Because of this, users miss out on all of the benefits of using a BI solution.	X		
Providing BI user training for beginners and other users, especially when users do not have the time to undergo training. You will notice this in almost every company that some people are so busy that they do not have the time to learn something that will eventually help them become more efficient in their work.	X	X	
Changes in source systems without communication or late communication to BI teams. Changes in source systems without informing the BI team can break the technical processes as a BI solution is dependent on source applications for data.		X	
As multiple components/tools make up the BI solution, continuous upgrade of the solution is a challenge. Every so often one or more of the components needs an upgrade.		X	X
In some of the BI implementations there are so many data sources, and at any given point in time some of those data sources are undergoing some changes, which mandates a change in the BI solution. Very difficult for BI teams to catch up.	X	X	

Using BI solutions for non-BI purposes. Users may try to find ways to use BI solutions in operational (non-BI) use cases. Thereby sometimes mandating high availability of the solution which otherwise wouldn't be required.		X	X
Data quality issues continue to cause problems in this phase too. When data quality issues are not fixed at source (source applications) and no processes are introduced to prevent data quality issues, the BI team will continue to face this challenge.		X	
As and when new data sources are integrated, resolving data ownership issues, ensuring data privacy and data security policies are not violated continues to be a challenge.		X	
Maintaining high availability. Ensuring that the application is always available for users across the world.			X
As and when new data sources are integrated, ensuring data consistency is a challenge. New source may have better quality data compared to previously loaded data and now decisions and measures must be taken to ensure there is consistency in the data.		X	
Dealing with too many requests (requirements) to BI teams, to the point that the team doesn't even have time to analyze the requirement to be able to provide even an estimate.	X	X	
Businesses now are very dynamic and several changes (for example, processes, organization, product, or service changes) are happening at such pace that it becomes difficult for the BI team to catch up with the changing business.	X	X	X

Growth in data is not linear but almost exponential. The BI team has to ensure that the systems are able to handle the growing load.			X
As the testing of a BI deliverable is more focused on confirming that the data in the deliverable is correct, for example, in a report or a dashboard rather than functionality testing, BI team has to actually check it in production environment to confirm its correctness. As data in production could be huge, verifying large sets of reports can be challenging.		X	X

***Table 4.3**: Challenges faced by BI teams in the live phase*

Conclusion

As we have seen in this chapter, there are quite a lot of challenges in every phase of a BI journey. We can overcome these challenges with various strategies and ideas which we will see in *Chapter 7: Ideas for Success with BI*. Challenges are inevitable, every initiative has its own set of challenges. That doesn't in anyway mean that BI projects or initiatives will fail. Some articles on various websites claim that 60 to 70% of the BI projects fail. These statements are good only for making headlines (read Clickbait). We cannot trust those articles because no evidence has been provided, not even a description of what do they mean by failure in a BI program or a project. There are many open questions, for example, was there a survey? If yes, how many companies were surveyed? Who actually conducted the survey? On what basis were the companies selected? For those businesses where it claimed that BI projects failed, did all other projects in that business succeed and only BI project fail? What was time period of the study? No answers for any of these questions. So, let's ignore those claims unless there are any evidence. And let's focus on the real challenges and be prepared.

In this chapter we have covered most of the common challenges faced in a BI journey. We haven't covered generic IT or software development challenges and have tried to limit to BI specific challenges. Some of these maybe common among other implementations as well. Before describing the challenges, different phases of a BI journey were explained. As mentioned in the introduction of this chapter, what you do by knowing these challenges totally depends on your role. Most of the challenges are role specific, that is, a challenge for one role may not seem like a challenge for another role, however, by being aware of these challenges, it will help one role to appreciate the other role's challenges. Once you understand the different

roles in BI, you will be able to appreciate these challenges even better. In the next chapter we will explore various roles in BI.

Points to remember

Some of the key points to remember are as follows:

- Different companies are at different levels of BI maturity, starting from "*Not aware of BI*" to "*Excellent BI solution and high user adoption*" as per the BI capabilities ladder.
- Three phases of a BI journey are:
  1. Initiation
  2. Implementation
  3. Live
- Live phase continues as long as the organization exists.
- There can be multiple trigger points that lead to beginning of a BI journey.
- Implementation phase in a BI journey means the end-to-end process from planning to delivery.
- Further development continues as part of the live phase. Enhancements, maintenance and support, and migration activities are also carried out as part of the live phase of a BI journey.
- Every phase in a BI journey has challenges.
- In the live phase both BI users and BI technical team face different sets of challenges
- How you use this knowledge about challenges in BI depends entirely on your role.

Multiple choice questions

1. **What percentage of BI projects fail?**
   a) 20 to 30%
   b) 40 to 50%
   c) More than 60%
   d) None of the above

2. **Which of these statements is most true?**
   a) All BI projects face some or the other challenges
   b) Every BI project has the same set of challenges
   c) Challenges are same irrespective of the roles
   d) Every BI project will have all of the challenges

3. **Which of the following is not one of the phases in a BI journey?**
   a) Initiation
   b) Implementation
   c) Live
   d) None of the above

4. **Initiation phase ends when**
   a) A BI project is started
   b) A BI program is started
   c) An RFP process has started for BI
   d) Any of the above'

5. **MUS stands for**
   a) Minimum utility service
   b) Minimum usable service
   c) Minimum usable solution
   d) Minimum use of solution

6. **Initiation phase in a BI journey means**
   a) Project initiation phase
   b) There is a vision to build BI capabilities
   c) Installation of BI solution
   d) Program initiation phase

7. **Implementation phase in a BI journey includes**
   a) Project planning
   b) Procuring infrastructure such as hardware and software
   c) Software development
   d) All of the above

8. **In which phase of BI journey is MUS available for BI users?**
   a) Initiation phase
   b) Implementation
   c) Live
   d) All of the above
9. **At Walget, the POS machines are being replaced and this means there is a change in the database and data model of the POS application from which data is flowing to the data warehouse. BI team integrates the new POS application in which phase?**
   a) Implementation phase
   b) Live
   c) None of these
   d) Both A and B
10. **BI projects are initiated by**
    a) Management
    b) Consultant
    c) Any employee
    d) Any of the above
11. **Who may resist a BI initiative?**
    a) Head or VP of a department
    b) Operational staff
    c) Excel specialist
    d) Any of the above
12. **At Walget, there are 10000 potential BI users, and 9000 are actual BI users, what is the BI user adoption rate?**
    a) 9%
    b) 90%
    c) 99.9%
    d) 0.9

Answers

1. **d**
2. **a**
3. **d**
4. **d**
5. **c**
6. **b**
7. **d**
8. **c**
9. **b**
10. **d**
11. **d**
12. **b**

Questions

1. Why many businesses are still not aware about BI?
2. What are some of the trigger points for BI initiatives?
3. What are the reasons for internal resistance to BI initiatives?
4. What are the challenges faced during the initiation phase of a BI journey?
5. Why do some employees resist BI implementation?
6. What are the four categories of challenges faced during the implementation phase of a BI journey?
7. What is GDPR and how does it become one of the challenges in implementing a BI solution?